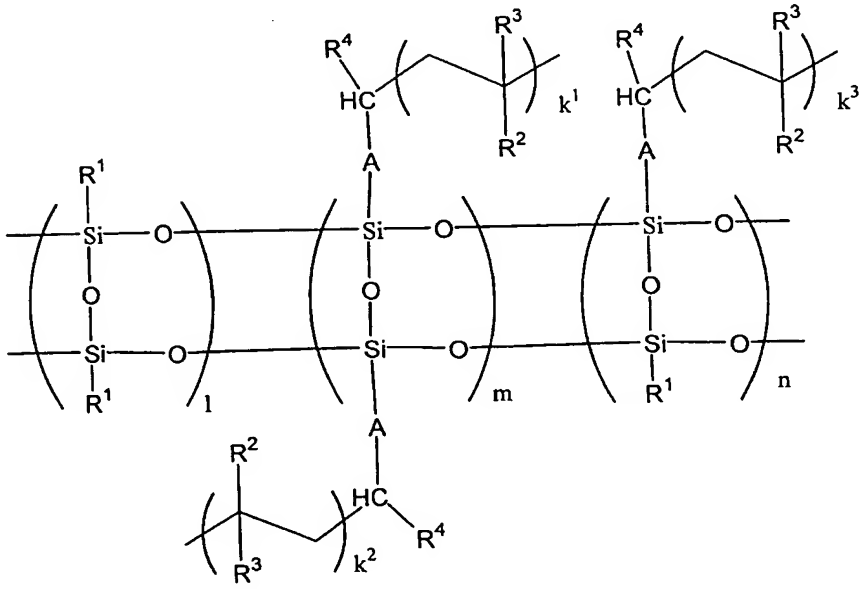
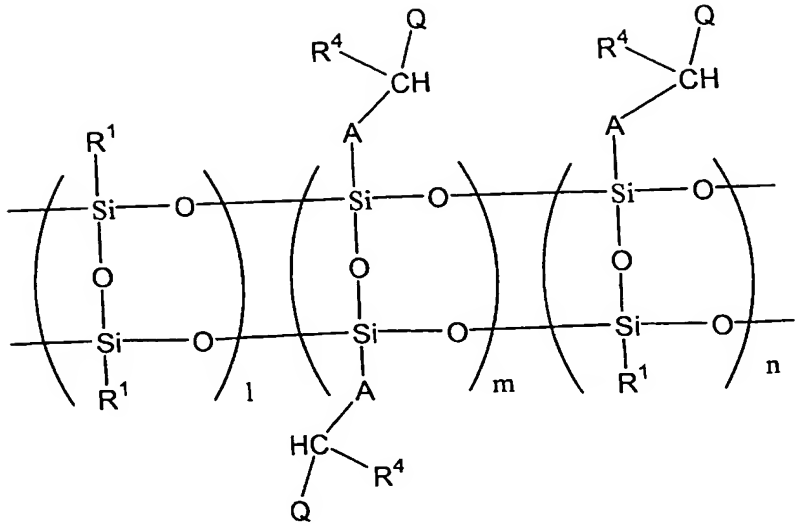
CLAIMS

1. A process for producing a polysilsesquioxane graft polymer including a repeating unit shown by the following formula (1) in the molecule,



(1)

wherein A represents a linking group, R^1 represents a hydrocarbon group which may have a substituent, R^2 represents a hydrogen atom or an alkyl group having 1 to 18 carbon atoms, R^3 represents a polar group or an aryl group which may have a substituent, R^4 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an ester group, or an acyl group, k^1, k^2, and k^3 individually represent arbitrary positive integers, provided that, when k^1, k^2, and k^3 respectively represent two or more, the groups shown by the formula: $-CH_2-C(R^2)(R^3)-$ may be the same or different, and l, m, and n individually represent zero or an arbitrary positive integer, provided that the case where "m=n=0" is excluded, the process comprising applying ionizing radiation or heat to a mixture including a polysilsesquioxane compound including a repeating unit shown by the following formula (2),



(2)

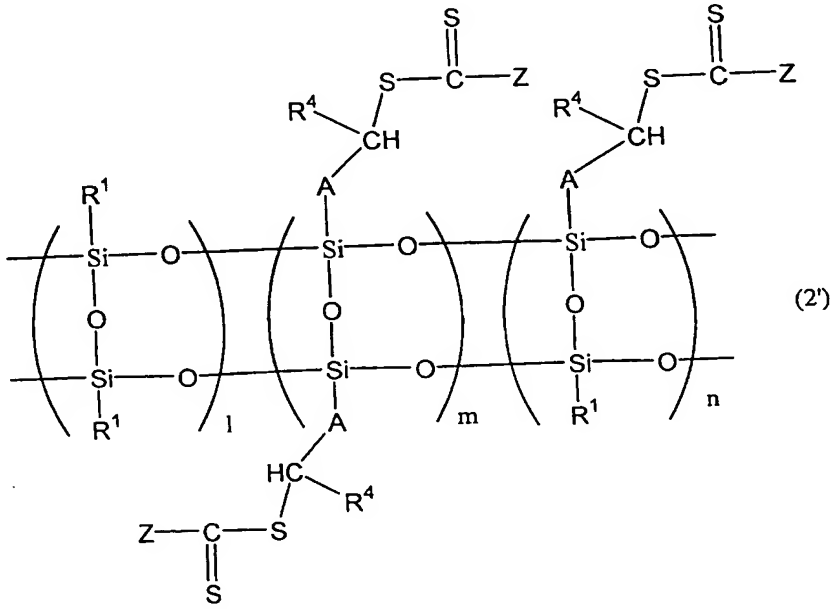
wherein A, R^1, R^4, l, m, and n have the same meanings as defined above, and Q represents an iniferter group, and a vinyl compound shown by the following formula (3): $CH_2=C(R^2)-R^3$ (wherein R^2 and R^3 have the same meanings as defined above).

2. The process for producing a polysilsesquioxane graft polymer according to claim 1, wherein ionizing radiation is applied to a mixture including the polysilsesquioxane compound including the repeating unit shown by the formula (2) in which Q is a photoiniferter group shown by the following formula: -S-C(=S)-Z (wherein Z represents a hydrocarbon group which may have a substituent, an alkoxy group, an aryloxy group which may have a substituent, an amino group which may have a substituent, or a phenyl group which may have a substituent) and the vinyl compound shown by the formula (3): $CH_2=C(R^2)-R^3$ (wherein R^2 and R^3 have the same meanings as defined above).

3. The process for producing a polysilsesquioxane graft polymer according to claim 1 or 2, comprising:

condensing an alkoxysilane compound shown by the following formula (4): $[XCH(R^4)A]Si(OR^5)_3$ (wherein A and R^4 have the same meanings as defined above, X represents a halogen atom, and R^5 represents an alkyl group having 1 to 6 carbon atoms) and an alkoxysilane compound shown by the following formula (5): $R^1Si(OR^6)_3$ (wherein R^1 has the same meaning as defined above, and R^6 represents an alkyl group having 1 to 6 carbon atoms) in an amount of 0 to 100 parts by weight for 1 part by weight of the alkoxysilane compound shown by the formula (4) in the presence of an acid catalyst or a base catalyst;

reacting the resulting polycondensation product with a compound shown by the following formula (6): M[SC(=S)-Z]a (wherein Z has the same meaning as defined above, M represents an alkali metal atom, an alkaline earth metal atom, or a transition metal atom, and a represents the valence of M) to obtain a polysilsesquioxane compound including a repeating unit shown by the following formula (2') in the molecule,



(2')

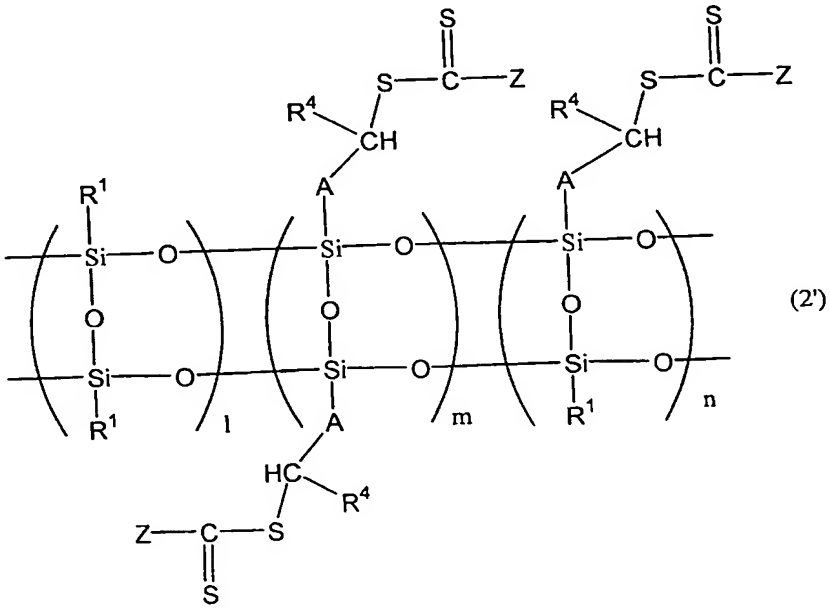
wherein A represents a linking group, R^1 represents a hydrocarbon group which may

have a substituent, R^4 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an ester group, or an acyl group, l, m, and n individually represent zero or an arbitrary positive integer, provided that the case where "m=n=0" is excluded, and Z represents a hydrocarbon group which may have a substituent, an alkoxy group, an aryloxy group which may have a substituent, an amino group which may have a substituent, or a phenyl group which may have a substituent; and

applying ionizing radiation to a mixture including the resulting polysilsesquioxane compound and the vinyl compound shown by the formula (3): $CH_2=C(R^2)-R^3$ (wherein R^2 and R^3 have the same meanings as defined above).

4. The process for producing a polysilsesquioxane graft polymer according to any of claims 1 to 3, wherein the polysilsesquioxane graft polymer has a number average molecular weight of 2,500 to 1,000,000.

5. A polysilsesquioxane compound comprising a repeating unit shown by the following formula (2'),



(2')

wherein A represents a linking group, R^1 represents a hydrocarbon group which may have a substituent, R^4 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an ester group, or an acyl group, l, m, and n individually represent zero or an arbitrary positive integer, provided that the case where "m=n=0" is excluded, and Z represents a hydrocarbon group which may have a substituent, an alkoxy group, an aryloxy group which may have a substituent, an amino group which may have a substituent, or a phenyl group which may have a substituent.

6. A pressure-sensitive adhesive comprising a polysilsesquioxane graft polymer obtained by the process according to any of claims 1 to 4.

7. A pressure-sensitive adhesive sheet comprising a substrate sheet, and a pressure-sensitive adhesive layer formed on the substrate sheet and including the pressure-sensitive adhesive according to claim 6.